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STUDY OF IMPACTS OF ORANGE JUICE ADS ON SCHNUCKS GROCERY STORE SALES AND CUSTOMERS

BY

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Introduction

Impacts of orange juice (OJ) newspaper ads on grocery store sales on all items and grocery store customers were estimated, using data for 14 Schnucks stores in the St. Louis area. For each store, there were 52 weekly observations for week ending December 22, 1991 through December 13, 1992. Attention was focused on the impacts of advertising for OJ, frozen concentrate orange juice (FCOJ) and chilled orange juice (COJ). For each type of advertising, an advertising dummy variable was created, taking a value of one if an ad of the type in question appeared during the week and zero if an ad did not appear. The advertising dummies were applicable to the entire St. Louis area and, hence, to each Schnucks store. Equations relating store sales and customers to these advertising variables were estimated by ordinary least squares (OLS).

Data Description

Descriptive statistics for the data studied are shown in Table 1. Grocery store sales on all items averaged $351,373 per store per week, while store customers averaged 16,055 persons per store per week. Ads for OJ, FCOJ and COJ appeared in 69%, 38% and 42% of the 52 weeks studied, respectively.

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Model

The model used in the study can be written as

(1) $y_{it} = \alpha_i + \beta t + \gamma Z_t$; $i=1,...,14$; $t=1,...,52$,

where y_{it} is either store sales or customers for store i during week t; α_i is an intercept for store i (store dummy variables were used in the regressions); β is a time trend parameter; and γ and Z_t are the advertising parameter and advertising dummy variable, respectively, for either OJ, FCOJ or COJ. Regression estimates for both equation (1), and equation (1) with y_{it} replaced by the log of y_{it} were obtained. In the former (latter) equation, the parameter γ indicates the increase (percentage increase) in either store sales or customers due to advertising.

Results

OLS regression estimates of the time trend and advertising effects (the store intercepts are omitted to focus on the other parameters) are shown in Table 2. All the parameter estimates, except for those for the advertising parameters for COJ in the sales equations, are significantly different than zero. All the time trend estimates are negative, suggesting some underlying situation in the St. Louis area which is adversely impacting store sales and customers.

Both OJ and FCOJ ads positively impacted store customers and sales. Ads for OJ (FCOJ) increased store customers and sales by .8% (1.5%) and 1.2% (1.6%), respectively, or 126 (244) persons and $4,322 ($6,344) per store per week. The COJ advertising impacts,

either insignificant, or negative and significant are probably spurious; it is unlikely that COJ ads have negative effects.

Table 1. Descriptive statistics for Schnucks stores.

Item	Mean	Standard Deviation
Sales Per Store Per Week (Dollars)	351,373	19,802
Customers Per Store Per Week (No. Persons)	16,055	626
OJ Ad Dummy	.69	.47
FCOJ Ad Dummy	.38	.49
COJ Ad Dummy	.42	.50

Table 2. Advertising impact on store sales and customers.

Item	Parameter Estimate				R^2	
	Trend		Advertising			
	Level	Log	Level	Log	Level	Log
OJ Sales	-513.78*	-.0015*	4322.26*	.0120*	.96	.97
OJ Customers	-14.66*	-.0009*	126.50*	.0079*	.96	.96
FCOJ Sales	-521.82*	-.0015*	6344.21*	.0162*	.96	.97
FCOJ Customers	-15.40*	-.0010*	244.44*	.0147*	.96	.97
COJ Sales	-455.17*	-.0013*	-1189.59	-.0014	.96	.97
COJ Customers	-11.87*	-.0008*	-137.26*	-.0076*	.96	.96

*Indicates parameter is significantly different than zero at the $\alpha = .10$ level of significance.